

### REMARKS

Claims 1-4 and 6-20 are rejected under U.S.C 103 (b) as being anticipated by Schaller. Schaller teaches the use of a musical instrument with a string (36) having a first end and a second end; a tailpiece (19) for securing the first end of the string, a head (not shown) remote from the tailpiece for securing the second end and comprising an anchor (22) connected with the second end and an arm (82) for pivoting the anchor about an axis transverse the axis of the string; wherein the pivoting the anchor in the first direction increases the tension in the string (column 5, lines 23-25) (claims 1, 12). Regarding claims 2-4 and 15 the device taught by Schaller includes the use of a lock (98) formed on the arm (232) impeding the pivoting of the arm (see figure 2). Regarding claims 6-9, and 16-19 the device taught by Schaller includes the use of a tuning means that comprises a thumbscrew (2170) for varying the tension of the strings and adjusting the anchor. Regarding claims 10 and 11, the musical instrument comprises a nut and a bridge (18), where the bridge forms a first critical point for the string and the nut comprises a second critical point, where the anchor is adjacent the nut. Regarding claims 13, 14 and 20, the musical instrument comprises a tensioner that comprises a lever (232) pivotable about an axis. Claim 5 is objected to as being dependant upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Borisoff, Stroh, Storey, Chang and Clpriani ('905), Matsui, and Rose teach of tuning devices.

In the applicant's BACKGROUND OF THE INVENTION, page 1, lines 16-18:

"Basically, a stringed musical instrument is a ... box ... serving as a support of a number of strings secured in tension on an outside surface of the box".

On page 2, lines 17-24:

"In ... changing the pitch of the string... (an) operation involves increasing and decreasing the tension of a given string for raising or lowering the string pitch. This ... operation is generally characterized as pitch tuning."

Further, on page 6, lines 29-30 and page 7, lines 1-4:

"In conventional stringed musical instruments tuning pegs secure the strings at the head of the instrument.... Problems exist for conventional peg tuning, such as the amount of peg tightening required and the need to compensate for on-going tuning and normal string stretch which takes place during use."

And, on page 4 lines 1-6:

"In the Proesldorfer U.S. Pat. No. 2,304,587, string tensioning devices on the tailpiece for fine tuning the pitch of the strings ... were disclosed, however, such pitch adjustment is quite limited in range and designed to offer minor adjustment of pitch rather than raising and adjusting from an untensioned condition the strings by the tuners placed on the head of the instrument."

And further still, on page 3, lines 25-29:

“Combination bridge and tailpiece assemblies have been known for some time” and sometimes “such assemblies were disclosed affording means for varying the tension on the strings and creating a tremolo effect”.

On Page 4 lines 8-12

“The first fulcrum tremolo combining the bridge and tailpiece” wherein “a beveled ridge portion of the base plate secured to the instrument body ... for permitting limited pivotal movement about the pivot axis for both the bridge and tailpiece portions “and thereby varying the tension on the strings and producing the desired tremolo effect.”

It is apparent to those skilled in these arts that:

- tuning pegs are devices generally located on the head of the instrument for bringing strings to a tuned or pitched condition;
- fine tuners are devices located on the bridge and/or tailpiece portion of a stringed musical instrument that may or may not comprise tremolos in general or fulcrum tremolos in particular that make limited adjustments to strings already tensioned to proper playing pitch in order to create the desired tremolo effect;
- tremolos are separate devices located on the body of the stringed instrument as a part of the bridge and/or tailpiece portion for varying the tuning of strings already in a condition at proper playing pitch and ideally returned to that initial tuned condition; and
- fulcrum tremolos are tremolos where both the bridge and the tailpiece pivot about the fulcrum or pivot axis, an axis that is transverse the direction of the strings.

Schaller Pat. No.: 4,512,232 is wholly directed to tremolo devices which are located on the bridge and/or tailpiece portion of a stringed musical instrument. The patent itself is entitled "TREMOLO TAILPIECE AND BRIDGE DEVICE".

Further, in the ABSTRACT:

"A tremolo tailpiece and bridge device for use with a guitar or similar stringed musical instrument ..."

Further, in Schaller's BACKGROUND OF THE INVENTION, paragraph 1, lines 5-10:

"This invention relates to guitars and similar stringed musical instruments and deals more particularly with a bridge and tailpiece device for use with such a guitar and operable by the player of the instrument to increase and decrease the tension applied to one end of the strings to create the tremolo effect".

Cipriani (5,227,571 and 5,347,905), Borisoff (5,542,230), Chang (5,939,653) and Rose (5,537,907) have filing dates after the filing date of the parent application:

"This is a continuation of pending application Ser. No. 08/027,729, filed Jan. 14, 1993, which is a divisional of application Ser. No. 07/607,458, filed Oct. 31, 1990, which issued on Mar. 30, 1993 as U.S. Pat. No. 5,198,601, which are each incorporated by reference as if fully set forth herein".

Schaller describes a bridge-tailpiece tremolo where the tailpiece means pivots around an axis transverse the direction of the strings and comprises fine tuners.

Stroh (4,688,461), Storey (4,742,750), and Takabayashi (4,608,906) all describe fulcrum tremolo devices with fine tuners which pivot around a fulcrum axis transverse the direction of the strings.

Steinberger (4,632,005) describes a tremolo means (where the tailpiece means pivots around an axis transverse the direction of the strings and the bridge portion is stationary) directed to modifying the tremolo effect such that the relationship between strings is maintained during the pivoting of the tremolo.

In the applicant's SUMMARY OF THE INVENTION, on page 2, line 16 - page 3, line 8:

"In ... changing the pitch of a string, two different operations are carried out. In one operation, the length of the string between the first and second critical points is adjusted, such as between the nut and the bridge element, and this is known as harmonic tuning. The second operation involves increasing or decreasing the tension on a given string for raising or lowering the string pitch. This second operation is generally characterized as pitch tuning. In practice, initially harmonic tuning is carried out and then pitch tuning.

A problem existing in tuning the strings is that the two different tuning operations tend to conflict. In harmonic tuning, the pitch is lowered when the distance between the critical points is increased and, conversely, when the distance is shortened, the pitch is raised. In pitch tuning, when the tension is increased, the pitch is raised and when the tension is decreased, the pitch is lowered. These different operations present difficulties in pitch tuning and maintaining the tuned condition of a stringed musical instrument.

When a fulcrum tremolo is used, there is the tendency when increasing string tension and raising of pitch, also to increase the length of the string, and, conversely, when decreasing string tension and lowering pitch, also to decrease the string length. Accordingly, when using a fulcrum tremolo, these counteracting features are not always balanced."

And in the applicant's SUMMARY OF THE INVENTION, page 7 lines 15-17:

"Therefore, one primary object of the present invention is to provide a stringed musical instrument with an improved arrangement for both harmonic tuning and fine tuning the instrument."

The applicant received U.S. Pat. No. 6,175,066 based on the parent application filed Oct 31, 1990. Claim 8 provides for a fulcrum tremolo wherein:

"at least one of said bridge elements has an enlarged curved surface and said enlarged curved surface extending generally in the direction of said strings, said second critical point travels a critical distance along the surface of said enlarged curved surface and displaces the second critical point from said essentially constant radius during the pivoting of said fulcrum tremolo about said fulcrum axis.

Further on page 12, lines 4-7:

"Macro-tuners refer to tuners with the capacity to raise and adjust from an untensioned condition strings to proper playing pitch, providing for alternate tunings, and compensation for substantial string stretch during the life of the string without additional means."

And on page 24, lines 12-14, a device for tensioning or tuning a string in a stringed musical instrument is presented:

"Another primary object of the present invention is to provide an adjustment device for bringing the strings to pitch at one of several coarse tunings quickly and then fine tuned by separate means."



And further, page 24, lines 24-30 and page 25, lines 1-2:

"A tuning device is provided for securing the string at the head of the instrument and then making a fine tuning adjustment by means of a thumb screw. The tuning device is pivoted on the head end of the stringed musical instrument and is movable between several tensioned positions and a untensioned or released position. In the tensioned position the anchorage for the string is located relatively close to the nut at the head end of the instrument so that little bending of the string takes place.

The tuning device is formed as a two armed L-shaped lever pivotally mounted on a bracket secured to the head end of the instrument in the region of the nut. The string is secured at a free end of one arm of the lever and a locking means for the device is provided adjacent the free end of the other lever arm. The locking means is in the form of a forceps-like clamp containing a plurality of teeth so that each tooth provides a different locking position. By changing the locking position the tension on the string can be quickly increased or decreased as required for providing preset pitch changes."

In the applicant's DETAILED DESCRIPTION OF THE INVENTION, page 34, lines 16-18 in reference to pitch tuning:

"In the past, any adjustment available in the bridge-tailpiece assembly has been limited to fine tuning, usually less than the range of three pitches where the octave has twelve pitches."

The prior art cited does not describe:

- a device for bringing the strings on a musical instrument to proper playing pitch by combining two separate means: one where one of several pitch tunings is quickly effected to a string and another where the string is then finely tuned at this pitch;
- where the means for pitch tuning is pivoted about an axis transverse the direction of the strings;
- where such a pitch tuning device can provide preset pitch changes;
- where such a device is located on either the head or body of the instrument; and, further
- where such a device comprises a tremolo in general or a fulcrum tremolo in particular and that the axis associated with the adjustment device may not be the same as the pivot axis associated with the tremolo means which is also transverse the direction of the strings; or, further
- where such a device when positioned on the body and includes the bridge portion in the tuning mechanism provides a means for simultaneously achieving harmonic and pitch tuning when the second critical point travels a critical distance on the bridge during the pivoting of the adjustment device about its associated axis into proper playing pitch; and even more so
- where such a device with these attributes comprises a bridge tail-piece assembly in general, a tremolo or a fulcrum tremolo in particular.

The applicant received U.S. Pat. No. 5,965,831 based on the parent application filed Oct 31, 1990 where the Primary Examiner was William M. Shoop, Jr. and the Assistant Examiner was the current Examiner in this application, Kim Lockett. Claims 7 and 8 provide for a fulcrum tremolo with a macro-tuner where the string is "gripped" between the bridge and the string anchor on the body of a stringed musical instrument.

On page 43 of the application, lines 1-4:

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles."

The applicant claims that the adjustment device described above with its inherent limitations is a macro-tuner and that, as an alternative embodiment to the macro-tuner in U.S. Pat. No. 5,965,831 providing a means for "gripping", when positioned on the head of the instrument, that this "gripping" would similarly be positioned between the string anchor at the head of the instrument and the nut or first critical point.

Further, the applicant claims when the adjustment device described above is mounted on the instrument body and includes the bridge portion so to be pivotable about the device axis, that simultaneous harmonic and pitch tuning is achieved at proper playing pitch.

In the applicant's SUMMARY OF THE INVENTION, page 11, lines 3-6,

"Yet another object of the invention is to provide an improved bearing arrangement for a fulcrum tremolo for assuring the proper and wide range of pivotal movement while limiting wear or friction which would tend to defeat the effectiveness of the tremolo."

Further, in the SUMMARY OF THE INVENTION, page 14, lines 22-26:

" ... the base plate is pivotally supported in a bearing assembly containing ball bearings adjustably mounted so that the plate can be variably spaced from the surface of the body."

And further, in the SUMMARY OF THE INVENTION, page 14, lines 30 - page 15, line 1, the applicant describes an alternative to the bearing arrangement mentioned above :

"Also by using self aligning bearings or bearings affording a universal type movement, it is possible effectively to support the base plate, when its axis is not parallel with the surface of the body."

And further, in the SUMMARY OF THE INVENTION, page 15, line 5-8:

"As compared to the knife-edge pivot support of the fulcrum tremolo disclosed in the Rose U.S. Pat. No. 4,1717,661, it is possible to limit the wear of the bearing so that unnecessary friction is not developed which would interfere with the return of the base plate to initial position".

Separately, the applicant claims for an improved bearing pivot means which ensures the fulcrum tremolo returns to initial position (without wear associated with knife-edge pivot means) and adjustably supports the fulcrum tremolo comprising either:

- a bearing assembly; or
- a portion of a ball bearing surface affording universal joint type movement.

Therefore, none of the prior art cited is a basis for objection or rejection for any or all of the claims, however, claim language has been recast to reflect a greater clarity and new claims have been added for additional clarity of the intent of the applicant.

In view of the above amendments, it is believed that this Application is now in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

By



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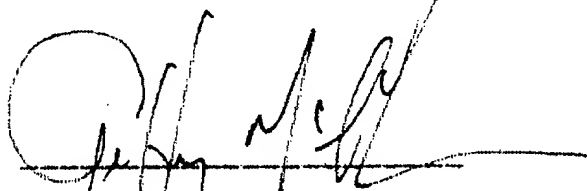
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